



- (51) International Patent Classification:
B65G 59/04 (2006.01)
- (21) International Application Number:
PCT/US2012/030192
- (22) International Filing Date:
22 March 2012 (22.03.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
61/466,047 22 March 2011 (22.03.2011) US
- (71) Applicant (for all designated States except US): **PRECISION PLANTING LLC** [US/US]; 23207 Townline Road, Tremont, IL 61568 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **SAUDER, Derek, A.** [US/US]; 14347 N Lake Windermere Road, Tremont, IL 61568 (US).
- (74) Agent: **OPPOLD, Thomas, J.**; Larkin Hoffman Daly & Lindgren Ltd., 1500 Wells Fargo Plaza, 7900 Xerxes Avenue South, Minneapolis, MN 55431 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

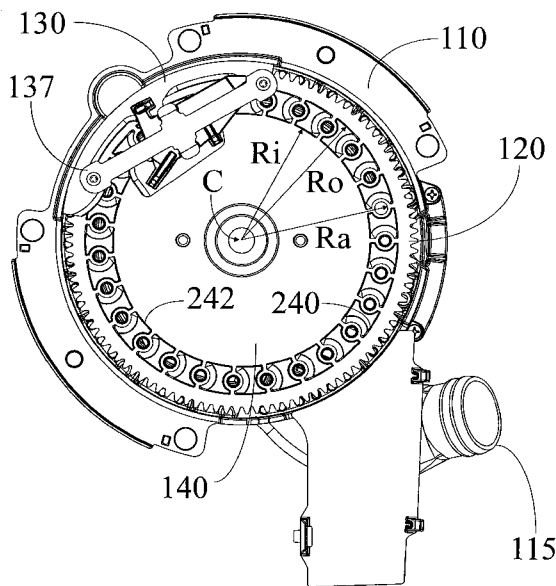
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

[Continued on next page]

(54) Title: SEED METER



(57) Abstract: A seed meter for an agricultural planter in which the seed disc is rotatably mounted within a seed meter housing. As the seed disc rotates, the apertures in the disc rotate along a seed aperture path through a horizontally adjacent seed pool area. The seed disc includes cavities disposed along the seed aperture path to agitate the seeds in the seed pool area. A singulator having multiple co-planar singulator surfaces is biased against the seed side surface of the seed disc.

WO 2012/129442 A3

Published:

— *with international search report (Art. 21(3))*

(88) Date of publication of the international search report:

25 April 2013

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/030192

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B65G 59/04 (2012.01) USPC - 221/211 According to International Patent Classification (IPC) or to both national classification and IPC</p>															
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC(8) - B65G 59/04 (2012.01) USPC - 111/77, 78, 177-186; 221/211, 263, 266, 278; 222/394, 410, 414</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatBase, Google Patents</p>															
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X ---</td> <td rowspan="2">US 5,170,909 A (LUNDIE et al) 15 December 1992 (15.12.1992) entire document</td> <td>1, 4-7, 10, 16</td> </tr> <tr> <td>Y</td> <td>2, 3, 8, 9, 17-20</td> </tr> <tr> <td>X ---</td> <td rowspan="2">US 7,152,542 B2 (EBEN et al) 26 December 2006 (26.12.2006) entire document</td> <td>11-15</td> </tr> <tr> <td>Y</td> <td>2, 3, 8, 9, 17-20</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X ---	US 5,170,909 A (LUNDIE et al) 15 December 1992 (15.12.1992) entire document	1, 4-7, 10, 16	Y	2, 3, 8, 9, 17-20	X ---	US 7,152,542 B2 (EBEN et al) 26 December 2006 (26.12.2006) entire document	11-15	Y	2, 3, 8, 9, 17-20
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.													
X ---	US 5,170,909 A (LUNDIE et al) 15 December 1992 (15.12.1992) entire document	1, 4-7, 10, 16													
Y		2, 3, 8, 9, 17-20													
X ---	US 7,152,542 B2 (EBEN et al) 26 December 2006 (26.12.2006) entire document	11-15													
Y		2, 3, 8, 9, 17-20													
<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/></p>															
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>“A” document defining the general state of the art which is not considered to be of particular relevance</td> <td>“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>“E” earlier application or patent but published on or after the international filing date</td> <td>“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>“O” document referring to an oral disclosure, use, exhibition or other means</td> <td>“&” document member of the same patent family</td> </tr> <tr> <td>“P” document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			“A” document defining the general state of the art which is not considered to be of particular relevance	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	“E” earlier application or patent but published on or after the international filing date	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	“O” document referring to an oral disclosure, use, exhibition or other means	“&” document member of the same patent family	“P” document published prior to the international filing date but later than the priority date claimed				
“A” document defining the general state of the art which is not considered to be of particular relevance	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention														
“E” earlier application or patent but published on or after the international filing date	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone														
“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art														
“O” document referring to an oral disclosure, use, exhibition or other means	“&” document member of the same patent family														
“P” document published prior to the international filing date but later than the priority date claimed															
<p>Date of the actual completion of the international search 07 June 2012</p>		<p>Date of mailing of the international search report 20 JUN 2012</p>													
<p>Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201</p>		<p>Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</p>													